SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-40

Name: Gateway County: Pennington
Legal description:
Location from nearest town: inside Ellsworth Airforce Base
Dates of present survey: June 25-27, October 3, 2007
Date last surveyed:
Most recent lake management plan: na
Management classification: Warm-water permanent
Contour mapped:

Primary Species: (game and forage)	Secondary and other species:
1. Largemouth bass	1. Bluegill
2. Redear sunfish	2. Yellow perch

PHYSICAL CHARACTERISTICS

Surface Area: Watershed: ___ acres
Maximum depth: ____ feet; Mean depth: ___ feet
Lake elevation at survey (from known benchmark): feet

1. Describe ownership of lake and adjacent lakeshore property:

The entire lake and surrounding property is owned by Ellsworth Airforce Base.

2. Describe watershed condition and percentages of land use:

3. Describe aquatic vegetative condition:

4. Describe pollution problems:

No pollution problems were identified during the 2007 survey.

5. Describe condition of all structures, i.e. spillway, level regulators, boat ramps, etc.:

BIOLOGICAL DATA

Methods

A lake survey was conducted at Gateway June 18-19, 2007. Sampling consisted of 4 trap net nights (Appendix C). Trap nets were set at four stations consisting of 1 trap net nights each. All trap nets were modified fyke-nets with a 1.3 X 1.5 m frame, 19.1 mm (0.75 in) mesh and a 1.2 X 23 m (3.9 X 75.5 ft) lead. Collected fish were measured for total length (TL; mm) and weighed (g).

Fish population parameters, confidence intervals and standard errors were computed using WinFin Analysis (Francis 2000). Parameters calculated were catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr) based on length categories. Abundance was expressed as the mean catch per unit effort (CPUE; mean number per net night). Population structural characteristics were expressed as length frequency histograms and stock density indices (PSD and RSD-P). Fish condition was expressed as mean Wr.

Results and Discussion

Fish Community Surveys

Overall, 5 fish species were collected during the lake survey conducted June 25-26, 2007 (Tables 1 and 2). A total of 282 fish were collected in frame nets, with redear sunfish comprising 60.6%, and bluegill comprising 35.5% of the sample. Green sunfish, yellow perch and largemouth were also sampled in small numbers. Population parameters of dominant game and forage species in Gateway Lake are discussed individually below.

Table 1. Total catch (N), catch per net night (CPUE; 80% CI's in parentheses), catch per net night of stock length fish (CPUE-S; 80%CI's), proportional stock densities (PSD, RSD-P; 90% CI's in parentheses), and condition factor (Wr for fish ≥ stock-length; 80%CI's) for all fish species collected from four ¾ inch trapnets in Gateway Lake, Pennington County, June 18-19, 2007.

Species	N	CPUE	CPUE-S	PSD	RSD-P	Wr ≥ S
Bluegill	100	25.0 (13.6)	25.0 (13.6)	47 (8)	2 (2)	97.3 (2.6)
Green sunfish	2	0.5 (0.8)	0.5 (0.8)	--	--	--
Largemouth bass	6	1.5 (0.8)	0.3 (0.4)	--	--	--
Redear sunfish	171	42.8 (12.7)	42.0 (12.5)	12 (4)	1 (1)	102.5 (0.5)
Yellow perch	3	0.8 (0.8)	0.8 (0.8)	--	--	--
Total	282					

Bluegill

Bluegill were the second most abundant panfish in Gateway Lake with a frame net CPUE of 25.0 (Table 1). Stock indices yielded a PSD of 47 with an RSD-P of 2. These numbers suggest Gateway is becoming a quality bluegill fishery since refilling in 2004. Fish condition was good with a Wr for stock length and larger fish of 97.3. Length frequency shows a good number of fish between 140 and 160 mm, which should provide excellent fishing in the near future.

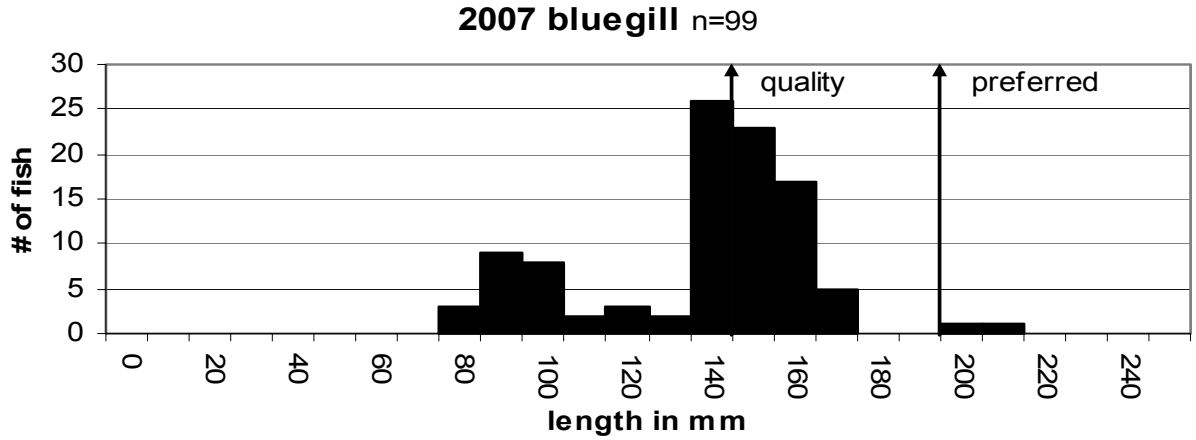

Figure 1. Length frequency histogram of bluegill collected by frame nets in Gateway Lake 2007.

Redear sunfish

In 2004, one hundred fifty adult redear sunfish were stocked after receiving them from the Nebraska Game and Fish. The 2005 length frequency shows the adults caught the next year in a frame net survey. In 2007, the length frequency shows good numbers of fish in the population of various sizes, indicating good natural recruitment. Redear were actually the most abundant species present in the survey with a frame net CPUE of 42.8. Fish condition was also good with a mean Wr for stock length and larger fish of 102.5.

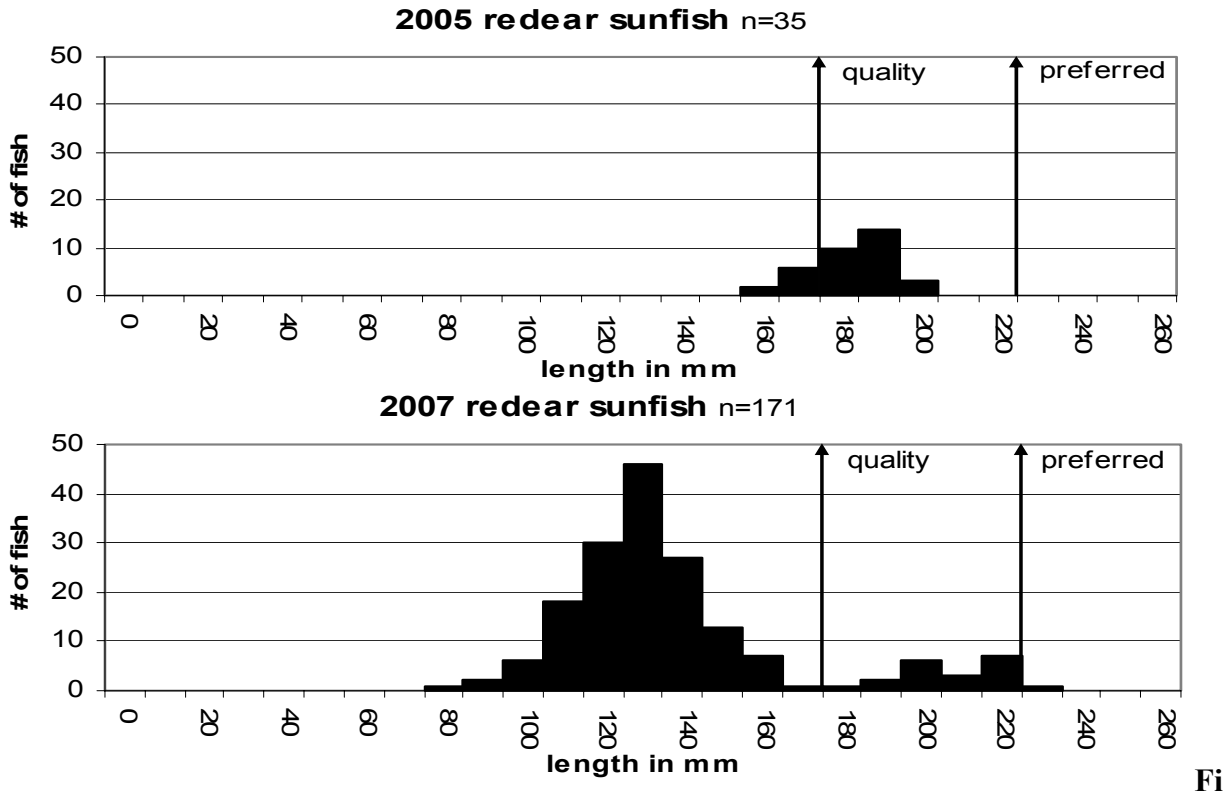

Figure 4. Length frequency histogram of redear sunfish collected by frame nets in Gateway Lake 2005, 2007.

LITERATURE CITED

Francis, J. 1999. Winfin, Version 2.95; Microsoft Access Program for data entry. Nebraska Game and Parks Commission, Lincoln.

Francis, J. 2000. WinFin Analysis Program. Version 1.5. Nebraska Game and Parks Commission, Lincoln.

Willis, D.W., D.A. Isermann, M.J. Hubers, B.A. Johnson, W.H. Miller, T.R. St. Sauver, J.S. Sorenson, E.G. Unkenholz, and G.A. Wickstrom. 2001. Growth of South Dakota Fishes: A Statewide Summary with means by region and Water Type. Special Report. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.

RECOMMENDATIONS

1. Conduct standard lake surveys at least once every three years to monitor fish populations.

APPENDICES

Appendix A. Stocking record for Gateway Lake, Pennington County, 2004-2007.

Year	Number	Species	Size
2004	150	Redear sunfish	Adult
2004	860	Largemouth bass	Fingerling